Cataract development in Norwegian patients with congenital aniridia

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Citation

Published Version
doi:10.1111/aos.12225

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stability and inhibited retinal and choroidal neovascularization with similar efficacy as anti-VEGF antibodies (Rennel et al. 2011). Several studies have shown that the simultaneous blockade of Ang-2/Tie2 and VEGF pathways reduces vascular leakage and tumour sprouting angiogenesis and has an additive effect to single-agent treatment without apparent increased systemic toxicity (Koh et al. 2010). Combined inhibition of Tie-2 and VEGF signalling was also more effective in terminating pathological retinal neovascularization than anti-VEGF therapy alone (Takagi et al. 2003).

In this study, we performed vitrectomy for the management of sight-threatening complications of ischaemic RVO in four patients (Table 1). Vitreous haemorrhage, neovascularization and some fibrosis formation were observed in all RVO eyes. None of the patients had previous ophthalmologic history or diabetes prior to RVO. Intravitreal injections of anti-VEGF blockade, such as with bevacizumab or ranibizumab, were not used in any of the study eyes preoperatively. The intravitreal concentrations of both Ang-2 and VEGF were significantly higher in eyes undergoing primary vitrectomy due to complicated RVO compared with eyes with a quiescent idiopathic macular hole or pucker (p ≤ 0.001; Table 1). This observation, together with the finding of normal intravitreal total protein and plasma Ang-2 levels among the patients with RVO, suggests that ischaemic retinal ECs secrete more Ang-2 than arises due to leakage from blood as a result of blood–retinal barrier breakdown. Interestingly, Ang-1, a factor with known vasculo-protective properties, was induced in RVO eyes.

Based on these findings, we suggest that the combination of Ang-2 inhibitors with anti-VEGF therapy may be a more potent treatment for RVO than anti-VEGF therapy alone. However, clinical trials are needed to confirm our hypothesis.

Acknowledgements

This study was supported by grants from the Finnish Eye Foundation, the Eye and Tissue Bank Foundation, the Mary and Georg C. Ehrenrooth Foundation, the Nissi Foundation, and HUCH Clinical Research Grants (TKK4150 and TYH1325).

References


Cataract development in Norwegian patients with congenital aniridia

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doi: 10.1111/aos.12225

Editor,

Congenital aniridia is caused by mutation of the PAX 6 gene, the so-called master gene in ocular development. Although cataract has been reported in several aniridia cohorts (Nelson et al. 1984; Sale et al. 2002; Hingorani Moore 2008; Abouzeid et al. 2009; Park et al. 2010; He et al. 2012), the timing and detailed phenotype of cataract in aniridia have not been well described. Here, we report the onset of cataract, timing of cataract surgery and phenotypic features of cataract in a Norwegian aniridia cohort.

A cohort of 26 Norwegian patients (52 eyes) with ngenital aniridia was examined on a single occasion, after obtaining written informed consent and ethical approval from the Regional Committee for Medical and Health Research Ethics, Oslo. Medical records were examined to detail cataract presence and surgical intervention. Digital slit lamp photographs of the lens and visual assessment were used to analyse the type and development of cataract, and aniridia-associated keratopathy (AAK) was characterized according to our previously published grading scale (Edén et al. 2012).

Mean patient age was 29 years (range: 4–63 years). Only three eyes were phakic with clear lenses; the remaining eyes had either cataract or had been operated on for cataract. The youngest individual with cataract was 4 years old at examination, but congenital or early onset cataract was documented in medical records of five patients (six eyes). Of 12 patients with nonoperated cataract, five (nine eyes) had lens luxation upwards. Of 14 patients, 27 eyes had glaucoma. Those least affected presented with a discrete posterior polar cataract. In other cases, a discrete subcapsular opacification of varying density or opacification extending radially from the midperiphery of the posterior capsule was found in addition to the polar cataract. A posterior subcapsular mid-peripheral ring of opacification was observed, in some also combined with a more substantial polar cataract. The size and density of the opaque ring varied.
Findings in other patients included nuclear cataract (both turbid and yellow-brownish), one generalized subcapsular oedema (mature cataract) and one with a dehydrated opaque lens (hypermature cataract) (Fig. 1). In two patients, an anterior polar cataract was identified one of which had an additional posterior subcapsular opacification (Fig. 1).

Of the 52 eyes examined, 25 had had surgical intervention (cataract, glaucoma or both). Nine patients (13 eyes) had cataract surgery only, six patients (eight eyes) both cataract and glaucoma surgery and three patients (four eyes) glaucoma surgery only. At the time of cataract surgery, 7 of 12 operated patients were under the age of 19 years and 4 of these were under the age of 10. Secondary cataract was observed in four patients (six eyes). Of the 25 eyes with surgical intervention, eight eyes (30%) had AAK affecting visual acuity compared to 8/25 eyes (32%) in the group of eyes without intraocular surgery. No clear trend could be found towards an increased prevalence of AAK in operated eyes.

Cataract is common in aniridia, with over 90% prevalence in our cohort, similar to a Korean cohort with 60 eyes where 88% had cataract or were operated for cataract (Park et al. 2010). Cataract prevalence in aniridia in the literature varies from 50 to 85% (Nelson et al. 1984).

Patients in our cohort not operated for cataract showed a distribution of lens opacities that could be interpreted as a pattern of cataract development. A discrete posterior polar opacity seems to emerge first. The posterior location of polar opacities has been reported previously (Yamn et al. 2011; Jin et al. 2012). The next phase is an additional subcapsular opacification in the mid-periphery. These opacities then increase in density and size, radiate to the polar region and are always limited to the posterior subcapsular region. They eventually form a ring on the posterior capsule.

References


Sale MM, Craig JE, Charlesworth JC et al. (2002): Broad phenotypic variability in a
Severe retinopathy of prematurity in twin–twin transfusion syndrome after multiple blood transfusions

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doI: 10.1111/aos.12229

Table 1. Characteristics of the twins.

<table>
<thead>
<tr>
<th>Twin pair 1</th>
<th>Twin pair 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donor</td>
<td>Recipient</td>
</tr>
<tr>
<td>Birth weight (g)</td>
<td>771</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>28 + 1</td>
</tr>
<tr>
<td>Prenatal glucocorticoids</td>
<td>Yes</td>
</tr>
<tr>
<td>AV (days)</td>
<td>8</td>
</tr>
<tr>
<td>RDS (grade 2–3)</td>
<td>Yes</td>
</tr>
<tr>
<td>Inhaled NO</td>
<td>No</td>
</tr>
<tr>
<td>Transfusions</td>
<td>9</td>
</tr>
<tr>
<td>ROP</td>
<td></td>
</tr>
<tr>
<td>ROP stage</td>
<td>5</td>
</tr>
<tr>
<td>Plus disease</td>
<td>Yes</td>
</tr>
<tr>
<td>First screening</td>
<td>33 + 4</td>
</tr>
<tr>
<td>PMAROP</td>
<td>35 + 3</td>
</tr>
<tr>
<td>PMA severe ROP</td>
<td>41 + 5</td>
</tr>
<tr>
<td>ROP treatment</td>
<td>Laser</td>
</tr>
<tr>
<td></td>
<td>Lensectomy</td>
</tr>
</tbody>
</table>

AV, artificial ventilation; ROP, retinopathy of prematurity; RDS, respiratory distress syndrome; PMA, postmenstrual age; Inhaled NO, inhaled nitric oxide; Severe ROP, ROP stage ≥ 3.